

REMARKS

Claims 1-19, 21-33, 35-40, 42-44, and 46 were pending and rejected by the non-final Office Action. No claims have been cancelled, and no new matter has been added by way of this amendment. Thus, Claims 1-19, 21-33, 35-40, 42-44, and 46 are currently pending. Applicants respectfully request favorable reconsideration of the present application in view of the following remarks.

Objection to the Drawings

Various typographical errors to the formal drawings have been addressed as discussed in the section entitled "Amendments to the Drawings". However, the drawings were also objected to as failing to comply with 37 CFR 1.84(p)(5). The Office Actions states that the description does not mention reference sign 317, which is referred to in Fig. 3. Applicants respectfully point out that the reference sign 317 appears on page 15, line 2, of the original patent application. In particular, the disclosure recites: "In certain embodiments of the present invention, the side 1 regenerator 316 can be selectably disabled (or bypassed), by a switch 317, so that the signal to the local T1 span is not regenerated." (Page 15, lines 1-3.) Therefore, Applicants respectfully request that this objection be withdrawn.

Objections to the Claims

Claim 3 was objected to by the Examiner under 37 C.F.R 1.75 (c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. The Applicants note that claim 2 was inadvertently presented as a duplicate of claim 3 in the Applicant's prior amendment in response to the 11/06/03 Office Action. Applicants respectfully request a correction of this typographical error to restore the original claim 2. As originally presented and listed above, claim 2 recites: "The repeater of claim 1, wherein the first signal transmission path further comprises a first signal regenerator; and the second signal transmission path further comprises a second signal regenerator." With restoration of

claim 2, Applicants respectfully submit that the objection under 37 C.F.R. 1.75 (c) has been met.

Claim Rejections - 35 U.S.C. § 112

Section 112, Paragraph 1 - Enablement of Claims 11 and 23-36:

Claims 11 and 23-26 were rejected under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement requirement. The Federal Circuit has interpreted § 112, first paragraph, to require “that the claimed invention be enabled so that any person skilled in the art can make and use the invention without undue experimentation. *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988).” MPEP 2164.01. However, “[i]n order to make a rejection, the examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993).” MPEP 2164.04. Importantly, “[a] patent need not teach, and preferably omits, what is well known in the art. *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991).” MPEP 2164.01. Applicants respectfully traverse the rejections.

Regarding claims 11, 23, and 25, the Examiner asserts that “[t]he specification does not provide sufficient details to enable one skilled in the art to make and use” claims 11, 23, and 25 because “it does not adequately describe . . . how to de-activate both loopback circuits with a loop-down code received at one input; [t]he specification does not provide enough details about the structure and operation of the elements associated with the above identified claimed features to enable one skilled in the art to make and use the invention without undue experimentation.” (Paper No. 9 at page 3, paragraph 6.)

The Applicants respectfully submit that the original specification, including the figures and claims, does satisfy the enablement requirement for claims 11, 23, and 25. Structurally, Fig. 3 shows a schematic drawing of an embodiment that allows one of skill in the art without undue experimentation to deactivate, for example, first and second loopback circuits on receiving a loopdown code in either a first or a second loopback code detector. In Fig. 3, a controller 340 comprises code detectors 312 and 328. Code detector 312 connects to a first input at transformer 308 while code detector 328 connects to a second input at

transformer 326. Additionally, Fig. 3 shows relay paths 318, 334, 350, and 348 that schematically indicate first, second, third, and fourth transmission paths, respectively, to one of skill in the art.

In terms of the operation of the elements of an embodiment, the specification reads: “[t]he inputs to the controller 340 from . . . the loopback code detectors 328 and 312 determine which of the relay paths 318, 334, 348, and 350 are open and closed.” (Page 13, lines 6-8.) In describing the operation of exemplary embodiments, the specification also reads:

[R]emote control of the loopback circuitry of the repeater includes in-band and out-of-band loop-down codes. Code detectors 312 and 328 are configured to automatically detect in-band 3-bit and 5-bit loop-down codes as are known in the industry as well as out-of-band ESF loop-down codes. . . . One industry standard use of this out-of-band channel is for sending loopback control codes. The detection of a loop-down code by either detector 312 and 328, whether in-band or out-of-band, results in the controller 340 taking down all the active loops.”

(Page 18, line 21 through Page 19, line 6.)

In order to enable claims 11, 23, and 25, given Fig. 3 and these excerpts from the specification, the patent need not teach and preferably omits what is well-known in the art. *Buchner*, 929 F.2d at 661; MPEP 2164.01. It is well known how to configure a controller 340, for example, to open relays 318 and 334 while closing relays 350 and 348 upon detection of an out-of-band ESF loop-down code at one of the input transformers 308 and 326 using code detectors 312 and 328. Such a well-known configuration of a controller enables an embodiment to, in the Examiner’s words, “de-activate both loopback circuits with a loop-down code received at one input.” (Office Action at page 3, paragraph 6.) Thus, Applicants respectfully submit that the Examiner has not asserted a reasonable basis to question the enablement of claims 11, 23, and 25. *Wright*, 999 F.2d at 1562. Furthermore, claims 24 and 26 depend from claims 23 and 25, respectively. Consequently, with respect to the claims 11 and 23-26, Applicants believe they have complied with the enablement requirement of § 112.

Section 112, Paragraph 2 – Antecedent Bases for Limitations in Claim 2-4 and 9:

The Examiner rejected claims 2-4 and 9 under 35 U.S.C. § 112, second paragraph, asserting an insufficient antecedent basis for certain limitations in these claims. Applicants

respectfully traverse these rejections.

With regard to claims 2 and 4, Applicants agree with the Examiner that Claim 2, as incorrectly submitted to the Office in a previous amendment, lacked an antecedent basis for the limitation “first signal regenerator”. However, as originally submitted, claim 2 correctly recited:

The repeater of claim 1, wherein

the first signal transmission path further comprises a first signal regenerator;
and the second signal transmission path further comprises a second signal regenerator.

Since claim 2 has now been restored to its original form, Applicants respectfully submit that “the first signal regenerator” in claim 3 and “the second signal generator” in claim 4 have a sufficient antecedent basis.

With regard to the original claim 9, Applicants agree with the Examiner that “the second digital carrier link” in line 2 lacks a sufficient antecedent basis. Applicants have amended claim 9 to recite, in pertinent part, “a second digital carrier link” instead of “the second digital carrier link”. This amendment is consistent with claim 1 and should satisfy § 112, second paragraph, without changing the scope of claim 9.

Finally, when reviewing the claims, it was noted that “forth” was misspelled in claim 4 since it is intended to be used as a number. The spelling has been corrected.

Accordingly, Applicants respectfully request the withdrawal of rejections under § 112, second paragraph.

Claim Rejections - 35 U.S.C. § 103(a)

Claims 1-2, 7-9, 12-14, 17, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Barton (U.S. Patent No. 5,343,461) in view of Gewin (U.S. Patent No. 5,060,226). Claims 15-16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton, Gewin, and Garcia (U.S. Patent No. 5,224, 149) in view of admitted prior art disclosed in the specification on page 14, lines 11-16. Claims 4, 22, 29, 32, and 36 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton in view of Gewin, and Garcia. Claim 28 was rejected under 35 U.S.C. 103(a) as being unpatentable over Barton in

view of Gewin, and Garcia. Claims 30, 31, and 37-39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton, Gewin, and Garcia in view of admitted prior art disclosed in the specification on page 14, lines 11-16. Claims 5 and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton, Gewin, and Garcia. Claims 10 and 27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton, Gewin, and Garcia. Claim 43 was rejected under 35 U.S.C. 103(a) as being unpatentable over Barton in view of admitted prior art disclosed in the specification on page 14, lines 11-16. Claims 19, 21, 33, 35, 40, 42, 44, and 46 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton, Gewin, Garcia, and admitted prior art in view of Bergstrom (U.S. Patent No. 5,521,977). Applicants respectfully traverse the rejections.

Generally, to establish a prima facie case of obviousness under § 103(a), three elements must be satisfied. First, there must be some affirmative suggestion or motivation in the prior art to combine or modify prior art references. Second, there must be a reasonable expectation of success found in the prior art. Third, the prior art references must teach or suggest all of the claim limitations. MPEP 2143.

Rejection of Claims 1-2, 7-9, 12-14, 17, and 18 over Barton in view of Gewin

Independent claim 1 comprises, in pertinent part, “a second selectively activated loopback circuit which, when activated, provides a fourth signal transmission path between the second input port and the first output port.” (Emphasis added) The Examiner asserted that “Barton teaches performing a loopback from the user side 24:34-55” and that this implies that such a second selectably-activated loopback circuit is “inherently part of the [Barton] system”. (Office Action at pages 5 and 8.) However, Applicants respectfully submit that Barton does not teach, explicitly or inherently, these claim limitations.

Contrary to the Examiner’s assertion, Barton does not teach a selectably-activated second loopback circuit between a second input and a first output. Barton only teaches the use of both *manual* and *remote* loopback circuitry associated with a *single* facility loopback path between a first input and a second output within the diagnostic interface 200. (See Barton, Figs. 5 and 6; 19:53-67 and 20:1-4). The following comments demonstrate this.

First, the text referred to by the Examiner in Barton at 24:34-55 describes a performance monitor 150, which can only monitor and store performance information in the

diagnostics interface 200 on the transmit signal path 114. The performance monitor 150 is not associated with loopback circuitry for the second input because it teaches monitoring performance of the second input directly, not looping it back. As a result, Barton does not “teach performing a loopback from the user side at 24:34-55” (Office Action at pages 5 and 8) using the performance monitor 150 described therein.

Second, Barton teaches that “upon occasion it is necessary that the diagnostics interface 200 be manually operated and placed into a facility loop-back test by using the manual control feature of the interface 200.” (37:29-32. *See also* 37:3-38). This facility loop-back, which is described throughout the Barton reference, refers to loopback toward the central station from an end-user, not toward the end-user. (See Barton at 1:49-52 and Figs. 1-6.) Notably, it can be activated manually from the user side in Barton but does not comprise a second loopback circuit from a second input to a first output.

Third, as is apparent in Barton from Figs. 5 and 6 and the disclosure at 30:56-31:6, the K1 relay 155 provides only a single facility loopback path. That single path flows from the first input to the second output. In fact, Barton does not teach or suggest any relay circuitry to switch the path of the second input to the first output. Thus, because the second input in Barton is connected *only* to the second output at transformer 135 and to the performance monitor 150, no fourth transmission path is taught or suggested between a second input and a first output. Consequently, Barton does not teach or suggest, either explicitly or inherently, the selectably-activated second loopback circuit limitations of claims 1 and 22.

Applicants agree with the Examiner that Barton does not teach the following, “a controller to activate the second loopback circuit and to activate first and second loopback circuits simultaneously.” (Office Action at page 5.) However, Applicants respectfully submit that Gewin does not teach the limitation of “a controller coupled with the first and second selectably-activated loopback circuit configured to selectively activate the first and second selectably-activated loopback circuits individually and simultaneously.”

First, the data selector 58 in Gewin referred to by the Examiner (Office Action at page 5) is not a loopback controller and cannot activate selectively the second loopback circuit. As explained by Gewin at 6:7-15, the data selector provides for the monitoring of both the near and far sides of the lines, not for looping back the incoming signals, either selectively or non-selectively. In practice, the Gewin data selector 58 “switches or interrogates rapidly between input signal 62 and input signal 72” (6:7-8) such that its monitoring capability operates non-

selectively and independent of any loopback capability in the Gewin test system.

Second, one skilled in the art must find a motivation in the prior art to combine Barton and Gewin to suggest the limitations of independent claim 1. The Examiner asserted that it would have been obvious to one skilled in the art to incorporate Gewin into Barton to improve Barton's system loopback capabilities of near and far sides. (Office Action at page 6.) As discussed above, Barton does not teach or suggest a near side loopback capability to improve. In addition, one of skill in the art would have no motivation to combine Barton and Gewin because Barton teaches a system that operates at the end-user location via a diagnostics interface 200 and has no need to loop back toward digital transmission lines on the near side. (See Barton, Figs. 1-6.) Specifically, the "facility loop-back diagnostics interface 200 is operatively connected to the network interface, thereby serving as a termination point for the . . . customer premises equipment *at the location of the end-user.*" (27:59-63, emphasis added.) Notably, without the need to investigate near side lines using a second loopback, Barton suggests that a performance monitor 150 that monitors its second digital input is sufficient diagnostically without a second loopback capability. In contrast to Barton, as seen explicitly in Figs. 2 and 3 of Gewin, Gewin teaches and suggests use of its network test system to test digital lines between the near side and far side, not at the location of the end-user. As such, one skilled in the art would find no motivation in the prior art to incorporate the teachings of Gewin into the system of Barton to improve the lookback capability of the near side since Barton has no need to test digital lines at the near side with the Gewin test system.

Third, whatever loopback capability that the Gewin test system has is not selectable. In fact, Gewin teaches away from selectiveness by teaching only simultaneous, non-selective loopback. Specifically, Gewin states:

It is important to note that when remote unit 44 is latched in this loopback mode, all the data received by remote unit 44 from either direction is echoed or looped back in the direction it was received from (either the near or far side of the line, as illustrated). All data is looped back to the respective sending device for error comparison and analysis.

(Gewin at 6:64-68, 7:1-2.) By explicitly rejecting a controller "configured to selectively activate the first and second selectably-activated loopback circuits individually", it is not appropriate to combine the references as desired by the Examiner.

Thus, in view of the missing elements in Barton and Gewin, the lack of motivation to

combine even if the elements were taught and the fact that the references teach away from the claimed invention, it is respectfully submitted that independent claim 1 is patentably distinct over the prior art of record. Dependent claims 2-19 and 21 depend from claim 1, and are also in condition for allowance. The various dependent claims include limitations that also define over the prior art of record.

Rejection of claims 4, 22, 28, 29, 32, and 36 over Barton in view of Gewin and Garcia

Merely by way of example, the arguments applicable to claim 22 below are equally applicable to dependent claim 4. Claim 4 depends from claim 2, and claims 22 and 36 are independent claims. Claims 22, 28 29, and 32 depend from claim 22.

Claim 22 recites in pertinent part, “a second selectably-activated loopback circuit which, when activated, loops the second regenerated signal to the first output port.” Claim 22 also includes the following pertinent limitation: “a controller to activate the second loopback circuit and to activate first and second loopback circuits simultaneously.” Thus, claim 22 is in condition for allowance in view of the overall discussion with respect to claim 1, above. With respect to claim 36, the arguments regarding a lack of motivation to combine Barton and Gewin, and the fact that the references teach away from each other, made with respect to claim 1, are applicable and the claim is in condition for allowance. However, these claims are in condition for allowance for at least the following additional reasons.

In claim 2, depending from claim 1, a recitation is made that “the second signal transmission path further comprises a second signal regenerator” and claim 4, depending from claim 2, recites in part that “the fourth transmission path further comprises the second signal regenerator when the second selectably-activated loopback circuit is activated.” Claim 22 recites in part “a second signal regenerator coupled between the second input and output for generating the second regenerated signal based on the second digital signal.” Finally, independent claim 36 recites the limitation “a second signal transmission path between the second input and output ports comprising a second signal regenerator.”

The Examiner acknowledges that neither Barton nor Gewin make any reference to “a second signal regenerator”. Thus, the Examiner relies on Garcia as a third reference to argue that the limitations of the indicated claims are met. Applicants agree with the Examiner that “Barton does not teach . . . a second signal regenerator coupled between second input and

output.” (Office Action at page 8, lines 12-14.) However, Applicants respectfully submit that there is no motivation or suggestion to combine “a second regenerator of Garcia into the system of Barton in view of Gewin to improve the system loopback capabilities for near and far sides”. (Office Action at page 9, lines 1-2.)

First, Applicants respectfully point out that claim 36 does not include a limitation involving a loopback feature. Thus, one of skill in the art would find no motivation to combine a second regenerator from Garcia into Barton to improve loopback capabilities in claim 36.

Second, and importantly, Barton and Garcia do not provide an affirmative motivation or suggestion for one skilled in the art to combine or modify the two references to arrive at the limitations of claims 4, 22, and 36 with respect to the second regenerator in combination with the associated recitations. Specifically, neither Barton nor Gewin provide motivation for the fourth transmission path further comprising the second regenerator when the second selectably-activated loopback circuit is activated as in claim 4; motivation for a second signal regenerator coupled between the second input and output for generating the second regenerated signal based on the second digital signal as in claim 22; or motivation for a second signal transmission path comprising a second signal regenerator as in claim 36. Among other things, as discussed above, Barton teaches a system operating at the end-user location. As such, the transmission signal sent from the second input transformer 139 in Figs. 5 and 6 of Barton is already appropriate to feed directly into the build-out circuit 129 for attenuation according to switch logic 189 without regeneration. (32:23-58.) Thus, the indicated signal path 114 between transformers 139 and 135 in Barton explicitly needs no regeneration, and Barton provides no additional teaching related to a second regenerator that would motivate the combination with Gewin and then with Garcia.

On the contrary, Barton suggests that a second regenerator of the second transmission signal path 114 is not desirable because, as seen in Figs. 5 and 6 of Barton, the monitoring regenerator 126 regenerates the test signal for the performance monitor 150 only after being split off from the second transmission path 114.

Similarly, Garcia teaches a repeater operating along a digital transmission away from an end-user location. (Garcia, Figs. 1 and 2.)

Thus, one of skill in the art would find no suggestion or motivation in the cited art of record to use the second regenerator at an end-user location where a second generator is not

desirable, as in Barton. For at least these reasons, one of skill in the art would find no motivation or suggestion in the prior art to combine Barton in view of Gewin and further in view of Garcia. Thus, claims 4, 22, and 36, and the claims that depend from them, are patentably distinct from the prior art of record.

Official Notice

The Examiner, either implicitly or explicitly, has taken Official Notice with respect to a number of the claims. For example, with respect to claim 28, there is absolutely no suggestion to combine the references to teach a pre-equalized circuit to shape the second regenerated signal before it reaches the second output port. The Examiner admits that the three references do not provide a teaching. However, the Examiner then goes on to state that it would have been obvious to incorporate a second pre-equalizer to shape the signal for the second generator into the system of Gewin, Garcia and Barton. (Office Action at page 9). Since no art is provided with respect to the recited limitations of claim 28 and the three references are admitted as not teaching the limitations, the Examiner appears to be taking official notice.

The Applicants request that support for the taking of Official Notice be provided as required by 37 CFR 1.104(d)(2) and MPEP 2144.04.

Support for the taking of Official Notice is requested with respect to all claims for which such notice is taken (e.g., claims 5, 6, 10, 27 and 28)

Further Rejections using a Combination of Barton, Gewin, Garcia, and allegedly admitted prior art

Claims 15-16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton, Gewin, and Garcia in view of admitted prior art disclosed in the specification on page 14, lines 11-16. Claims 30, 31, and 37-39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton (U.S. Patent No. 5,343,461), Gewin (U.S. Patent No. 5,060,226), and Garcia (U.S. Patent No. 5,224,149) in view of admitted prior art disclosed in the specification on page 14, lines 11-16. Claims 19, 21, 33, 35, 40, 42, 44, and 46 were rejected under 35 U.S.C. 103(a) as being unpatentable over Barton, Gewin, Garcia, and admitted prior

art in view of Bergstrom (U.S. Patent No. 5,521,977). Independent claim 43 has been rejected as being unpatentable over Barton in view of the same alleged art.

As a preliminary matter, Applicants disagree with the Examiner's recitation of the allegedly admitted prior art. Notably, the patent disclosure states that

“[s]uch detectors are known in the art but *have not been utilized on extension repeaters*. These detectors determine, based on the received data's characteristics, the DS-1 framing type being used by the sending network. Framing possibilities include: unframed, SF/D4, and T1-ESF and define exactly how data and control bits are grouped, what are allowed bit sequences, and what bit codes indicate frame beginnings.”

(Page 14, lines 12-16, emphasis added.)

Applicants respectfully submit that the statement made at page 14 is not a teaching, particularly when considered in light of all of the claim limitations. Merely by way of example, with respect to independent claim 43, the alleged prior art does not affirmatively teach or suggest first and second frame format detectors configured to determine the formats of first and second signals on first and second transmission paths, respectively. At best, the cited statement at page 14 simply teaches what frame detectors do. This means that no prior art reference or admission has been cited in the Office Action to teach frame detectors that are configured as claimed.

Further, no affirmative motivation or suggestion exists in the prior art to combine frame detectors with the prior art of record, including Barton, to improve visual indication of the signals received. (Office Action at page 13, line 1-2.) In the present application, the statement at page 14 explicitly declares that frame detectors are unknown in a repeater. Thus, no motivation or suggestion exists in the allegedly admitted prior art to combine a frame detector with a repeater, much less into the *diagnostic system* of Barton to make a *repeater*. Moreover, Barton does not mention frame repeaters or frame detection, so it cannot provide any of the necessary motivation to combine frame detectors into the diagnostic system. The motivation is also lacking as to the other references of record.

Finally, the present application teaches the following purpose of the visual indicator limitation that provides indications based on the detected frame format: “Each side of the repeater has a framing indicator 342a which allows a technician to quickly determine if the local T1 span and the DSX-1 network agree on the framing type used.” (Present application

at page 14, lines 17-19.) This teaching and functionality do not appear in the prior art related to repeaters, indicating the non-obviousness of repeaters comprising frame detectors and visual indicators of frame format. For these reasons at least, the prior art provides no affirmative motivation or suggestion.

With respect to the rejection of claims 19, 21, 33, 35, 40, 42, 44 and 46, Applicants note that the rejection required the combination of five different alleged teachings, including alleged admitted prior art. It is impermissible for the Examiner to reconstruct the claimed invention from selected pieces of prior art absent some suggestion, teaching, or motivation in the prior art to do so. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051-52, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988). Thus, references cannot be combined based on hindsight. The fact that the Examiner attempts to combine five references together in order to reject the claims, while not in and of itself evidence that the claims would not have been obvious to one of ordinary skill in the art at the time of invention, here demonstrates that the Examiner is lacking motivation to support the alleged obviousness of Applicants' claims. The Examiner has impermissibly chained together references.

CONCLUSION

Pursuant to the Office Action and the amendments above, it is believed the application is now in condition for allowance. Specifically, claims 1-19, 21-33, 35-40, 42-44 and 46 should be in condition for allowance. If, however, there are any outstanding issues that can be resolved by telephone conference, the Examiner is earnestly encouraged to telephone the undersigned representative.

Attorney Docket No. 00-VE12.24
S/N.: 09/630,413

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Any fees associated with the filing of this paper should be identified in an accompanying transmittal. However, if any additional fees are required in connection with the filing of this paper, permission is given to charge Deposit Account No. 07-2347, under order number 00-VE12.24.

Respectfully submitted,

Dated: August 13, 2004

Telephone No. (972) 718-4800

CUSTOMER NO.: 32127

By 
Joel Wall, Reg. No. 25,468
Attorney for Applicant
Verizon Corporate Services Group Inc.
c/o Christian Andersen
600 Hidden Ridge Drive,
Mailcode HQE03H14
Irving, TX 75038